#include <DHT.h>

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

#if defined(ESP32)

#include <WiFi.h>

#include <FirebaseESP32.h>

#elif defined(ESP8266)

#include <ESP8266WiFi.h>

#include <FirebaseESP8266.h>

#endif

#include <addons/TokenHelper.h>

#include <addons/RTDBHelper.h>

// ---------- CONFIG SECTION ---------- //

#define DHTPIN 2 // DHT sensor data pin (GPIO2)

#define DHTTYPE DHT11 // Use DHT22 if needed

#define WATER\_SENSOR\_PIN A0 // Analog water level sensor pin

#define WIFI\_SSID "P"

#define WIFI\_PASSWORD "123456789"

#define API\_KEY "AIzaSyAZDU5OW7NEKnekyrF3darB6-COarcAqws"

#define DATABASE\_URL "https://iot-project-ce8c0-default-rtdb.firebaseio.com/"

#define USER\_EMAIL "utkarshkhuspare777@gmail.com"

#define USER\_PASSWORD "123456"

// ----------------------------------- //

// Firebase & DHT Setup

FirebaseData fbdo;

FirebaseAuth auth;

FirebaseConfig config;

DHT dht(DHTPIN, DHTTYPE);

// LCD Setup: 0x27 is the default I2C address for many LCDs

LiquidCrystal\_I2C lcd(0x27, 16, 2);

// Firebase update timer

unsigned long sendDataPrevMillis = 0;

const long interval = 5000; // 5 seconds

void setup() {

Serial.begin(115200);

dht.begin();

Wire.begin(4, 5); // SDA = D2, SCL = D1

lcd.init();

lcd.backlight();

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("Starting...");

WiFi.begin(WIFI\_SSID, WIFI\_PASSWORD);

Serial.print("Connecting to Wi-Fi");

while (WiFi.status() != WL\_CONNECTED) {

Serial.print(".");

delay(300);

}

Serial.println();

Serial.print("Connected with IP: ");

Serial.println(WiFi.localIP());

Serial.println();

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("WiFi Connected");

Serial.printf("Firebase Client v%s\n\n", FIREBASE\_CLIENT\_VERSION);

config.api\_key = API\_KEY;

config.database\_url = DATABASE\_URL;

auth.user.email = USER\_EMAIL;

auth.user.password = USER\_PASSWORD;

config.token\_status\_callback = tokenStatusCallback;

Firebase.begin(&config, &auth);

Firebase.reconnectWiFi(true);

Firebase.setDoubleDigits(5);

delay(2000);

lcd.clear();

}

void loop() {

if (Firebase.ready() && millis() - sendDataPrevMillis > interval) {

sendDataPrevMillis = millis();

// --- Read Sensor Data --- //

float temp = dht.readTemperature();

float hum = dht.readHumidity();

int waterLevel = analogRead(WATER\_SENSOR\_PIN);

// Check for sensor read errors

if (isnan(temp) || isnan(hum)) {

Serial.println("Failed to read from DHT sensor!");

return;

}

String levelStatus = "Unknown";

if (waterLevel > 500) {

levelStatus = "Full";

} else if (waterLevel > 300) {

levelStatus = "Mid";

} else {

levelStatus = "Empty";

}

// --- Print to Serial Monitor --- //

Serial.println("Uploading to Firebase...");

Serial.print("Temperature: "); Serial.println(temp);

Serial.print("Humidity: "); Serial.println(hum);

Serial.print("Water Level Value: "); Serial.println(waterLevel);

Serial.print("Water Status: "); Serial.println(levelStatus);

// --- Display on LCD --- //

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("T:"); lcd.print(temp, 1); lcd.print("C ");

lcd.print("H:"); lcd.print(hum, 0); lcd.print("%");

lcd.setCursor(0, 1);

lcd.print("W:"); lcd.print(waterLevel);

lcd.print(" "); lcd.print(levelStatus);

// --- Push to Firebase --- //

Firebase.setFloat(fbdo, "/tank/temperature", temp);

Firebase.setFloat(fbdo, "/tank/humidity", hum);

Firebase.setInt(fbdo, "/tank/waterLevelValue", waterLevel);

Firebase.setString(fbdo, "/tank/status", levelStatus);

}

}